

REMARKS

Claims 1-37 are cancelled, and claims 38-52 remain pending in the application. The pending claims stand rejected as being unpatentable over Hunt I (5,836,506) in view of Fukasawa (4,842,706), and Hunt II (6,073,830) in various combinations. Applicant respectfully requests reconsideration of such rejections.

The pending claims recite physical vapor deposition target constructions in which a physical vapor deposition target consisting essentially of high purity aluminum material is diffusion bonded to an aluminum-containing backing plate, and in which a predominate portion of the grains in the target material are less than 100 microns in maximum dimension. The claims are believed allowable over the Examiner's cited references for at least the reason that the references do not suggest or disclose a target consisting essentially of high purity aluminum diffusion bonded to an aluminum-containing backing plate, and having a predominate portion of the grains of the target material being less than 100 microns in maximum dimension.

The Examiner cites Fukasawa for disclosing that an average grain size within a target material can be between 1 micron and 1 millimeter. However, Applicant respectfully submits that Fukasawa indicates that several materials can be formed in accordance with the methodology described therein, including molybdenum, tungsten, tantalum, niobium, titanium, nickel, vanadium, chromium and aluminum; and further that Fukasawa has no example describing what the particular grain size of aluminum materials is. Accordingly, it is impossible to tell from Fukasawa if the aluminum materials disclosed therein have a grain size on the lower end of the described range (i.e., a grain size approaching 1 micron),

or a grain size on the higher end of the disclosed range (i.e. a grain size of about 1 millimeter). Further, the target materials of Fukasawa are not diffusion bonded to backing plates, and accordingly it is impossible to tell if the grain sizes described in Fukasawa would be retained if the target materials were bonded to a backing plate. The Examiner cites the Hunt references to show that it is known in the art to bond aluminum-containing target materials to backing plates. The Examiner recognizes that the Hunt references do not disclose aluminum-containing target materials bonded to backing plates while retaining the predominate portion of grains in the target material of less than 100 microns in maximum dimension as recited in Applicant's claims.

The Examiner contends that it would be obvious to utilize the aluminum-containing materials of Fukasawa in the processing of Hunt; further that it is reasonable to assume that the aluminum-comprising materials of Fukasawa have a grain size on the lower end of Fukasawa's disclosed range of 1 micron to 1 millimeter; and further that it is reasonable to assume that the aluminum grains in Fukasawa's materials would not grow substantially upon bonding the aluminum target materials to a backing plate to the extent that the aluminum grains would have a size greater than Applicant's recited 100 microns in maximum dimension.

Applicant respectfully submits that the Examiner is engaging in an unreasonable amount of speculation to support the contention that Applicant's claimed target constructions are suggested by the combination of the Fukasawa and Hunt references. Specifically, the Examiner first speculates that aluminum-comprising target materials would have average grain sizes on the lower end of the range described in Fukasawa, rather than the higher end of the range, even though nothing in Fukasawa indicates where aluminum-

containing materials fall within the range described by Fukasawa. The Examiner then speculates that the target materials disclosed in Fukasawa can be subjected to diffusion bonding processes in accordance with the teachings of Hunt, and that the grain sizes will not grow to a size which exceeds Applicant's recited 100 microns in maximum dimension, even though nothing in Hunt provides an indication of quantitation of the effect of the processing of Hunt on an aluminum grain size. Applicant's specification indicates at, for example, page 5, line 17 through page 6, line 7, that one difficulty in prior art processes for diffusion bonding of aluminum-containing targets to aluminum-containing backing plates is that the diffusion bonding temperature can cause crystalline grains in the aluminum targets to grow beyond a desired size, and that an improvement of the present invention is that the crystalline grains in the aluminum target remain relatively small (i.e. less than 100 microns) in targets comprising high purity aluminum and treated utilizing the methodology of the present invention. Nothing in the Examiner's cited references suggests that the combination of such references produces the small grain sizes (the grain sizes less than 100 microns in maximum dimension) of Applicant's claimed invention.

The arguments presented above were discussed with the Examiner in a telephone interview, and the examiner suggested that Applicant provide a Declaration signed by the inventor and stating that the combination of Fukasawa and Hunt would not produce the grain sizes recited in claims 38-52. Submitted herewith is a "Declaration of Anthony F. Beier Under 37 C.F.R. §1.132" stating that if the high purity aluminum or aluminum alloy target referred to in Fukasawa is exposed to the diffusion bonding methodology described in Hunt, the grain sizes of Fukasawa would no longer be valid, and further that there is no

evidence in either Fukasawa or Hunt which considers stabilization of target grain size when combining pre-bonding target metallurgy to a bonding application.

The inventor's Declaration does not speak to a particular quantitation of the grain sizes which would result if the target materials of Fukasawa were treated by the methodology of Hunt, because in the inventor's opinion it is impossible to perform such calculation without knowing considerably more about the Fukasawa and Hunt processes. However, the Examiner is reminded that the burden is initially on the Patent Office to establish a *prima facie* case of obviousness. Presently, the Office has failed to establish the *prima facie* case, as there is no suggestion amongst the references that treatment of the material in Fukasawa by the processing of Hunt would result in Applicant's claimed diffusion bonded high purity aluminum material having a grain size of less than 100 microns in maximum dimension. The Examiner is reminded that under MPEP §706.02(j) the burden of establishing a *prima facie* case of obviousness requires that the Examiner show that there is some suggestion or motivation to combine reference teachings, and of a reasonable expectation of success from the combination of the reference teachings. In the present case, there is no motivation for treating the target materials of Fukasawa with the diffusion bonding technologies of Hunt, and further the Examiner has failed to establish that if the target materials of Fukasawa were treated by the diffusion bondings of Hunt there would be a reasonable expectation that the resulting target materials would have Applicant's recited grain size of less than 100 microns in maximum dimension.

For the above-discussed reasons, claims 38-52 are believed allowable over the Examiner's cited references, and Applicant therefore requests formal allowance of such claims in the Examiner's next action.

Respectfully submitted,

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